AMENDMENTS TO THE CLAIMS

Please amend the claims to read as follows. Deletions are shown in ~~strikeout~~ text; additions are underlined. Only Claims 40-45 are amended pursuant to this Amendment

1. Cancelled

2. (Previously Presented) An illumination module, comprising:

a dielectric layer having first and second sides;

a light emitting diode (LED);

a plurality of electrically-conductive contacts on the first side of the dielectric layer, the plurality of contacts being configured to mount the LED such that the LED is electrically connected to the contacts;

a heat conductive body on the second side of the dielectric layer;

a heat conductive tab comprising a heat conductive surface in communication with the heat conductive body, the heat conductive surface having a surface area substantially greater than a surface area of the heat conductive body;

wherein heat from the LED is communicated through the contacts, dielectric layer, and heat conductive body to the heat conductive surface.

3. Cancelled

4. (Previously Presented) The illumination module of Claim 2, wherein the heat conductive tab behaves as a heat sink.

5. (Previously Presented) The illumination module of Claim 2, wherein heat is dissipated from the heat conductive surface to the surrounding environment.

6. (Previously Presented) The illumination module of Claim 2, wherein the heat conductive body is generally flat.

7. (Previously Presented) The illumination module of Claim 6, wherein the contacts are substantially flat and coplanar relative to each other.

8. (Previously Presented) The illumination module of Claim 7, wherein the body is substantially parallel to the contacts.

9. (Previously Presented) The illumination module of Claim 4, wherein the heat conductive body has a first side and a second side, the first side communicating with the second

side of the dielectric layer, and the heat conductive surface is substantially complementary to the second side of the heat conductive body.

10. Cancelled

11. Cancelled

12. (Previously Presented) The illumination module of Claim 9, wherein the heat conductive surface has a thermal conductivity greater than about 100 W/mK.

13. (Previously Presented) The illumination module of Claim 12, wherein the heat conductive surface comprises a metal.

14. (Previously Presented) The illumination module of Claim 13, wherein the heat conductive surface comprises aluminum.

15. (Previously Presented) The illumination module of Claim 12, wherein the body has a thermal conductivity greater than about 100 W/mK.

16. (Previously Presented) The illumination module of Claim 12, wherein the heat conductive surface is substantially rigid.

17. (Previously Presented) The illumination module of Claim 9, wherein the dielectric member is substantially planar.

18. (Previously Presented) The illumination module of Claim 9, wherein the heat conductive surface is significantly larger than the second side of the heat conductive body.

19. (Previously Presented) The illumination module of Claim 2, wherein each of the LEDs comprises a lead, and the leads are configured to be mounted to respective contacts.

20. (Previously Presented) A method of making an illuminated display, comprising:

providing a housing having at least one wall surface;

providing a plurality of the illumination modules of Claim 2; and

mounting the plurality of illumination modules onto the at least one wall surface.

21. Cancelled

22. (Previously Presented) The method of Claim 20 additionally comprising mounting an illumination module so that at least a portion of the heat conductive tab is not in contact with the housing wall surface.

23. (Previously Presented) An illumination apparatus, comprising:

a housing;

a heat conductive tab comprising a heat conductive surface arranged in an interior of the housing; and

an illumination module mounted on the heat conductive surface, the illumination module comprising:

a dielectric having a first side and a second side;

a light emitting diode (LED);

a plurality of electrically conductive contacts on the first side of the dielectric, the plurality of contacts being configured to mount a lead of the LED such that the LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric;

wherein heat from the LED flows through the contacts and dielectric to the heat conductive body, and from the body to the heat conductive surface.

24. (Previously Presented) The apparatus of Claim 23, wherein the contacts communicate heat to the heat conductive body through a first thermal engagement area, and an engagement surface of the body communicates heat to the heat conductive surface through a second thermal engagement area that is larger than the first thermal engagement area, and the heat conductive surface is significantly larger than the engagement surface of the heat conductive body.

25. (Previously Presented) The apparatus of Claim 24, wherein the heat conductive body contacts the heat conductive surface.

26. (Previously Presented) The apparatus of Claim 29, wherein the housing comprises a wall surface, and the heat conductive surface is attached to the wall surface.

27. (Previously Presented) The apparatus of Claim 23, wherein the heat conductive body is substantially flat.

28. Cancelled

29. (Previously Presented) The apparatus of Claim 23, wherein the heat conductive tab is larger than the heat conductive body.

30. (Previously Presented) The apparatus of Claim 29, wherein the heat conductive surface is substantially flat.

31. (Previously Presented) The apparatus of Claim 29, wherein the heat conductive tab comprises a material having a thermal conductivity greater than about 100 W/mK.

32. (Previously Presented) The apparatus of Claim 23, wherein the housing comprises a wall surface, and at least a portion of the heat conductive surface is spaced from the wall surface.

33. (Previously Presented) The apparatus of Claim 32, wherein the heat conductive surface is configured to draw LED-generated heat from the module for dissipation in the housing.

34. (Previously Presented) An illumination apparatus, comprising:

a housing comprising a plurality of wall surfaces that define a channel;

a heat conductive surface arranged in an interior of the housing; and

an illumination module mounted on the heat conductive surface, the illumination module comprising:

a dielectric having a first side and a second side;

a light emitting diode (LED);

a plurality of electrically conductive contacts on the first side of the dielectric, each of the plurality of contacts being configured to mount a lead of the LED such that the LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric;

wherein heat from the LED flows through the contacts and dielectric to the heat conductive body, and from the body to the heat conductive surface.

35. (Previously Presented) The apparatus of Claim 34, wherein a translucent cover extends over the channel.

36. (Previously Presented) The apparatus of Claim 35, wherein heat from the LED is drawn to the heat conductive surface and dissipated from the surface into the channel.

37. Cancelled

38. Cancelled

39. (Previously Presented) An illumination apparatus, comprising:

a heat conductive body having a first side and a second side;

a thin dielectric portion on a first side of the heat conductive body;

a plurality of light emitting diodes (LEDs); and

a plurality of electrically-conductive contacts on a first side of the dielectric portion, the LEDs being mounted to the contacts such that the LEDs are electrically connected to one another, the contacts thermally communicating with the dielectric portion through a first thermal communication area between the contacts and the first side of the dielectric portion;

wherein a second side of the dielectric portion is arranged on the first side of the heat conductive body so that the first side of the body is in thermal communication with the contacts through the dielectric portion;

wherein the first side of the body has a surface area larger than the thermal communication area;

a heat conducting surface;

wherein the second side of the body has a surface generally complementary to the heat conducting surface, and the second side of the body thermally communicates with the heat conducting surface through a second thermal communication area between the body and the heat conducting surface; and

wherein the second thermal communication area has a greater area than the first thermal communication area;

whereby heat is thermally conducted from the LEDs to the heat conducting surface.

40. (Currently Amended) The illumination apparatus ~~module~~ of Claim 39, wherein the second side of the body has a generally flat surface.

41. (Currently Amended) The illumination apparatus ~~module~~ of Claim 40, wherein the contacts are substantially flat and coplanar relative to each other.

42. (Currently Amended) The illumination apparatus ~~module~~ of Claim 41, wherein a first side of the body is substantially flat and parallel to the contacts.

43. (Currently Amended) The illumination apparatus ~~module~~ of Claim 42, wherein the dielectric portion is substantially flat.

44. (Currently Amended) The illumination apparatus ~~module~~ of Claim 39, wherein the heat conductive body has a thermal conductivity greater than about 100 W/mK.

45. (Currently Amended) The illumination apparatus ~~module~~ of Claim 39, wherein the heat conductive surface has a thermal conductivity greater than about 100 W/mK.

46. (Previously Presented) An illumination module for mounting on a heat conducting surface that is larger than the module, the module comprising:

a heat conductive body having a first side and a second side;

a thin dielectric portion on a first side of the heat conductive body;

a plurality of light emitting diodes (LEDs); and

a plurality of electrically-conductive contacts on a first side of the dielectric portion, the LEDs being mounted to the contacts such that the LEDs are electrically connected to one another, the contacts thermally communicating with the dielectric portion through a thermal communication area between the contacts and the first side of the dielectric portion;

wherein a second side of the dielectric portion is arranged on the first side of the heat conductive body so that the first side of the body is in thermal communication with the contacts through the dielectric portion; and

wherein the first side of the body has a surface area larger than the thermal communication area, and the second side of the body has a surface generally complementary to the heat conducting surface to provide thermally conductive contact with the heat conducting surface;

whereby heat is thermally conducted from the LEDs to the heat conducting surface; and

additionally comprising a heat conductive tab that comprises the heat conductive surface.

47. (Previously Presented) The illumination module of Claim 46, wherein the heat conductive tab is larger than the heat conductive body.

48-65. Cancelled

66. (Previously Presented) The illumination module of Claim 9, wherein the body is connected to the heat conductive surface so that heat flows from substantially the entire second side of the body to the heat conductive surface.

67. (Previously Presented) The illumination module of Claim 66, wherein the second side of the body is attached substantially flush to the heat conductive surface by an adhesive.

68. (Previously Presented) The illumination module of Claim 18, wherein substantially the entire second side of the body communicates with the heat conductive surface.

69. (Previously Presented) The apparatus of Claim 24, wherein the engagement surface of the heat conductive body is connected to the heat conductive surface via an adhesive.

70. (Previously Presented) The apparatus of Claim 69, wherein substantially the entire engagement surface engages the heat conductive surface so that the second thermal engagement area is substantially the same as the engagement surface area.

71. (Previously Presented) The apparatus of Claim 34 additionally comprising a heat sink within the housing, and the heat conductive surface is integrally formed with the heat sink.

72. (Previously Presented) The apparatus of Claim 71, wherein the heat conductive surface is generally flat, and at least a portion of the heat sink extends at an angle relative to the heat conductive surface.

73. (Previously Presented) An illumination device, comprising:

a light emitting diode (LED) module in combination with a heat sink member, the LED module attached to the heat sink member, the LED module comprising:

at least one LED;

a dielectric layer having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric layer, the contacts being configured to mount the at least one LED such that the at least one LED is electrically connected to the contacts; and

a heat conductive body having a first and second face, the first face being on the second side of the dielectric layer, the body being in thermal communication with the plural contacts through the dielectric layer, the first face having a surface area at least the same as an aggregate surface area of one side of the contacts;

wherein the second face of the heat conductive body is attached to the heat sink member so that heat flows from the body to the heat sink member, at least an engagement portion of the second face conducting heat flow from the body to the heat sink, the engagement portion having a surface area at least the same as the aggregate surface area of one side of the contacts;

wherein the heat sink member has a surface area greater than a surface area of the heat conductive body.

74. (Previously Presented) An illumination device as in Claim 73, wherein the heat sink member has a mount portion configured to accept the LED module, and the LED module is attached to the mount portion.

75. (Previously Presented) An illumination device as in Claim 74, wherein the mount portion is integrally formed with the heat sink member.

76. (Previously Presented) An illumination device as in Claim 75, wherein the mount portion is disposed at an angle relative to an adjacent portion of the heat sink member.

77. (Previously Presented) An illumination device as in Claim 75, wherein the LED module is fastened to the mount portion using rivets.

78. (Previously Presented) An illumination device as in Claim 75, wherein the LED module is fastened to the mount portion by an adhesive.

79. (Previously Presented) An illumination device as in Claim 78, wherein the adhesive comprises a heat conductive adhesive.

80. (Previously Presented) An illumination device as in Claim 78, wherein the heat conductive body comprises a flat aluminum plate.

81. (Previously Presented) An illumination device as in Claim 80, wherein substantially the entire second face of the body portion is connected to the mount portion.

82. (Previously Presented) An illuminated display apparatus, comprising:

a plurality of the illumination devices recited in Claim 73 electrically connected to one another in an electrically parallel arrangement; and

a display member having a wall surface;

wherein at least one of the plurality of illumination devices is arranged on the wall surface.

83. (Previously Presented) An illumination display apparatus as in Claim 82, comprising a pair of electrical supply wires, wherein each of the plurality of illumination devices is electrically connected to the pair of electrical supply wires.

84. (Previously Presented) An illumination display apparatus as in Claim 83, wherein the illumination devices employ insulation displacement connectors to electrically connect to the pair of electrical supply wires.

85. (Previously Presented) An illuminated display apparatus as in Claim 82, wherein the display member comprises a channel defined by a plurality of walls, and the illumination devices are disposed within the channel.

86. (Previously Presented) An illuminated display apparatus as in Claim 82, wherein the wall surface is configured to function as a heat sink.

87. (Previously Presented) An illumination apparatus, comprising:

an illumination device as recited in Claim 73; and

a housing, the housing having a light outlet aperture and being attached to the heat sink member so as to generally enclose the LED module;

wherein the apparatus is adapted so that light from the LED module is directed out of the housing aperture.

88. (Previously Presented) An illumination apparatus as in Claim 87 additionally comprising an optical element for directing light from the LED module in a desired direction.

89. (Previously Presented) An illumination apparatus as in Claim 88, comprising a lens.

90. (Previously Presented) An illumination apparatus as in Claim 88, comprising at least one reflector.

91. (Previously Presented) An illumination apparatus, comprising:

a substantially enclosed housing comprising a housing wall and a light-transmissive portion;

a heat sink having a mount portion, the mount portion disposed within the enclosed housing;

a lighting module comprising:

a light emitting diode (LED);

a dielectric having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric, the contacts being configured to mount the LED so that the LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric, the heat conductive body having opposing first and second faces, the first face being connected to the dielectric;

wherein the heat conductive body second face is attached to the heat sink mount portion so that heat from the LED flows through the dielectric to the heat conductive body, and from the body to the heat sink via the mount portion.

92. Cancelled

93. (Previously Presented) The apparatus of Claim 91, wherein substantially the entire second face is connected to the mount portion.

94. (Previously Presented) The apparatus of Claim 91, wherein the body is connected to the mount portion using a mechanical fastener.

95. (Previously Presented) The apparatus of Claim 91, wherein the body is connected to the mount portion by an adhesive.

96. (Previously Presented) The apparatus of Claim 91, wherein the mount portion is integrally formed with the heat sink.

97. (Previously Presented) The apparatus of Claim 96, wherein the mount portion is disposed at an obtuse angle relative to an adjacent portion of the heat sink.

98. (Previously Presented) An illumination apparatus, comprising:

a substantially enclosed housing comprising a housing wall and a light-transmissive portion;

at least one heat sink having a mount portion, the mount portion disposed within the enclosed housing;

a plurality of lighting modules, each lighting module comprising:

a light emitting diode (LED);

a dielectric having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric, the contacts being configured to mount the LED so that the LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric; and

a pair of electrical supply wires, an elongate portion of the pair of electrical supply wires arranged within the housing, wherein each of the lighting modules is electrically connected to the elongate portion of the pair of electrical supply wires; and

wherein the heat conductive body of each of the plurality of lighting modules is attached to a corresponding mount portion so that heat from the LED flows through the dielectric to the heat conductive body, and from the body to the heat sink via the mount portion..

99. (Previously Presented) The apparatus of Claim 98, wherein the lighting modules employ insulation displacement connectors to electrically connect to the pair of electrical supply wires.

100. (Previously Presented) An illumination apparatus, comprising:

a substantially enclosed housing comprising a housing wall and a light-transmissive portion;

a heat sink having a mount portion, the mount portion disposed within the enclosed housing;

a lighting module comprising:

a light emitting diode (LED);

a dielectric having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric, the contacts being configured to mount the LED so that the LED is electrically connected to the contacts, the contacts thermally communicating with the dielectric through a thermal communication area between the contacts and the first side of the dielectric; and

a heat conductive body on the second side of the dielectric, the body comprising first and second sides, the first side being connected to the second side of the dielectric;

wherein the second side of the heat conductive body is connected to the mount portion, a thermal communication area between the second side of the body and the mount portion being greater than the thermal communication area between the contacts and the first side of the dielectric; and

wherein heat from the LED flows through the dielectric to the heat conductive body, and from the body to the heat sink via the mount portion.

101. (Previously Presented) An illumination device, comprising:

a light emitting diode (LED) module in combination with a heat sink member, the LED module attached to the heat sink member, the LED module comprising:

at least one LED;

a dielectric layer having first and second sides;

plural electrically-conductive contacts on the first side of the dielectric layer, the contacts being configured to mount the at least one LED such that the at least one LED is electrically connected to the contacts; and

a heat conductive body on the second side of the dielectric layer, the body being in thermal communication with the plural contacts through the dielectric layer;

wherein the heat conductive body is attached to the heat sink member so that heat flows from the body to the heat sink member; and

wherein the heat sink member comprises:

a surface area greater than a surface area of the heat conductive body; and

a mount portion integrally formed with the heat sink member and configured to accept the LED module, the mount portion being disposed at an angle relative to an adjacent portion of the heat sink member;

wherein the LED module is attached to the mount portion.

102. (Previously Presented) An illumination device as in Claim 101, wherein the LED module is fastened to the mount portion by an adhesive.

103. (Previously Presented) An illuminated display apparatus, comprising:

a plurality of the illumination devices recited in Claim 101 electrically connected to one another in an electrically parallel arrangement; and

a display member having a wall surface;

wherein at least one of the plurality of illumination devices is arranged on the wall surface.

104. (Previously Presented) An illuminated display apparatus as in Claim 103, wherein the wall surface is configured to function as a heat sink.

105. (Previously Presented) An illumination apparatus, comprising:

an illumination device as recited in Claim 101; and

a housing, the housing having a light outlet aperture and being attached to the heat sink member so as to generally enclose the LED module;

wherein the apparatus is adapted so that light from the LED module is directed out of the housing aperture.

106. (Previously Presented) An illumination apparatus as in Claim 105 additionally comprising an optical element for directing light from the LED module in a desired direction.

107. (Previously Presented) An illumination apparatus as in Claim 105, comprising a lens.

108. (Previously Presented) The illumination module of Claim 68, wherein the tab is angled relative to an adjacent portion of the heat conductive body.

109. (Previously Presented) The apparatus of Claim 26, wherein the heat conductive tab is disposed at an angle relative to the housing wall surface.

110. (Previously Presented) The apparatus of Claim 91, wherein the apparatus comprises a plurality of heat sinks, each heat sink having a mount portion, and at least one lighting module is attached to each mount portion so that the second face of the respective module heat conductive body is connected to the respective heat sink mount portion.

111. (Previously Presented) The apparatus of Claim 110, wherein each body is connected to the respective mount portion by an adhesive.

112. (Previously Presented) The apparatus of Claim 111 additionally comprising a pair of electrical supply wires, an elongate portion of the pair of electrical supply wires arranged within the housing, wherein each of the lighting modules is electrically connected to the elongate portion of the pair of electrical supply wires.

113. (Previously Presented) The apparatus of Claim 100, wherein substantially the entire second face is connected to the mount portion.

114. (Previously Presented) The apparatus of Claim 100, wherein the housing wall comprises at least part of the heat sink.

115. (Previously Presented) The apparatus of Claim 100, wherein a current modifying device is disposed adjacent the heat sink, the apparatus additionally comprising electrical wires adapted to deliver an AC electrical power to the current modifying device, the current modifying device adapted to deliver a modified electrical power to the lighting module.

116. (Previously Presented) The apparatus of Claim 115, wherein the current modifying device comprises a rectifier.

117. (Previously Presented) The apparatus of Claim 116, wherein the current modifying device is enclosed within the housing.